GROUP 00

GENERAL

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HOW TO USE THIS MANUAL

M1001000101180

SCOPE OF MAINTENANCE, REPAIR AND SERVICING EXPLANATIONS

This manual provides explanations, etc. concerning procedures for the inspection, maintenance, repair and servicing of the subject model. Note, however, that for engine and transmission-related component parts, this manual covers only on-vehicle inspections, adjustments, and the removal and installation procedures for major components. For detailed information concerning the inspection, checking, adjustment, disassembly and reassembly of the engine, transmission and major components after they have been removed from the vehicle, please refer to separate manuals covering the engine and the transmission.

ON-VEHICLE SERVICE

"On-vehicle Service" is procedures for performing inspections and adjustments of particularly important locations with regard to the construction and for maintenance and servicing, but other inspection (for looseness, play, cracking, damage, etc.) must also be performed.

INSPECTION

Under this title are presented inspection and checking procedures to be performed by using special tools and measuring instruments and by feeling, but, for actual maintenance and servicing procedures, visual inspections should always be performed as well.

DEFINITION OF TERMS

STANDARD VALUE

Indicates the value used as the standard for judging the quality of a part or assembly on inspection or the value to which the part or assembly is corrected and adjusted. It is given by tolerance.

LIMIT

Shows the standard for judging the quality of a part or assembly on inspection and means the maximum or minimum value within which the part or assembly must be kept functionally or in strength. It is a value established outside the range of standard value.

REFERENCE VALUE

Indicates the adjustment value prior to starting the work (presented in order to facilitate assembly and adjustment procedures, and so they can be completed in a shorter time).

DANGER, WARNING, AND CAUTION

DANGER, WARNING, and CAUTION call special attention to a necessary action or to an action that must be avoided. The differences among DANGER, WARNING, and CAUTION are as follows:

- If a DANGER is not followed, the result is severe bodily harm or even death.
- If a WARNING is not followed, the result could be bodily injury.
- If a CAUTION is not followed, the result could be damage to the vehicle, vehicle components or service equipment.

INDICATION OF TIGHTENING TORQUE

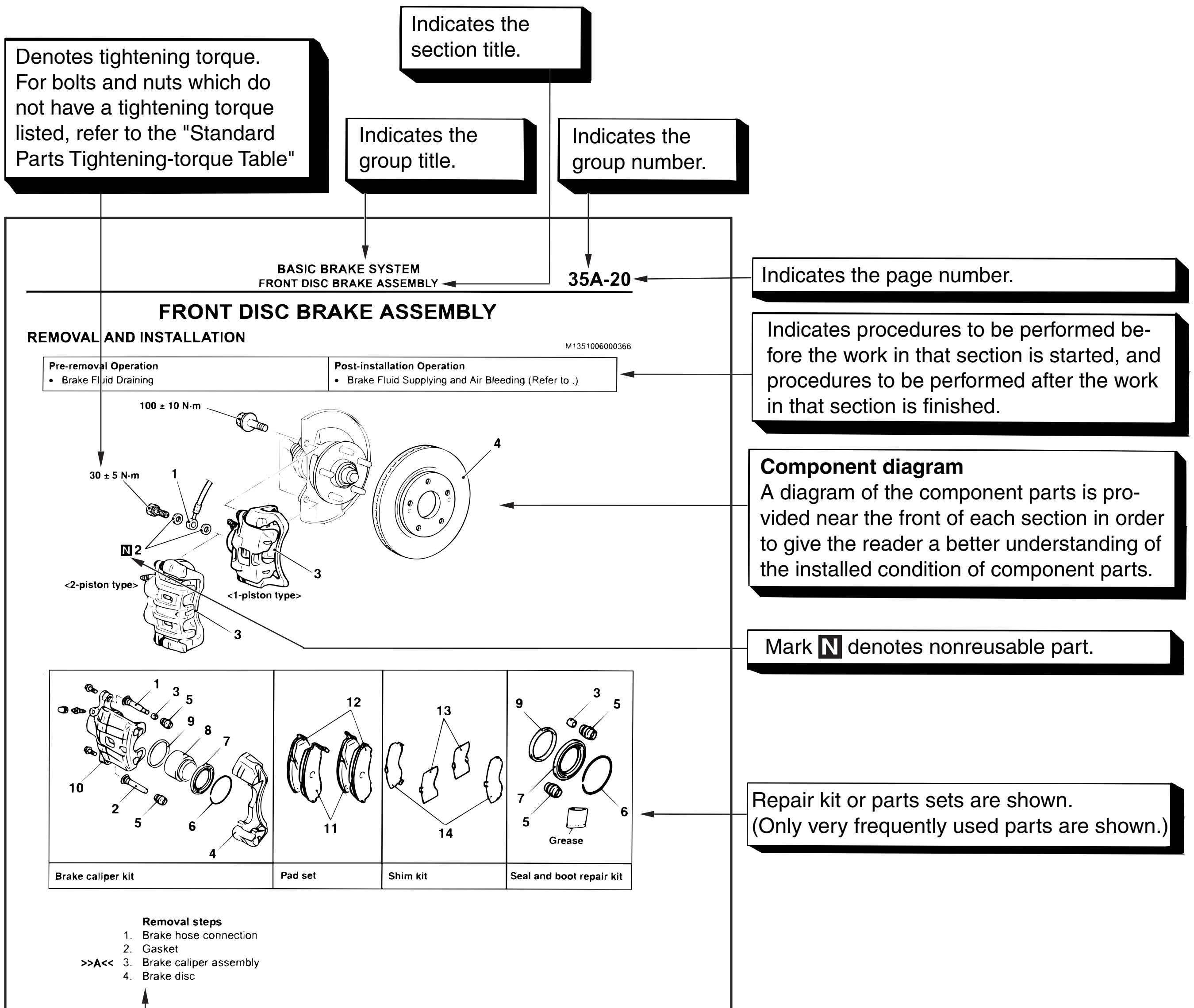
Tightening torque (units: N·m) is set to take into account the central value and the allowable tolerance. The central value is the target value, and the allowable tolerance provides the checking range for tightening torques. If bolts and nuts are not provided with tightening torques, refer to Standard Part/Tightening-Torque Table P.00-32.

MODEL INDICATIONS

The following abbreviations are used in this manual for identification of model types.

DOHC: Indicates an engine with the double overhead camshaft.
MIVEC: Indicates an engine with the mitsubishi innovative valve timing electronic control system.
MPI: Indicates the multipoint injection.
M/T:Indicates the manual transmission.
CVT: Indicates the continuously variable transmission.
A/C: Indicates the air conditioner.

EXPLANATION OF MANUAL CONTENTS



Maintenance and servicing procedures

The numbers provided within the diagram indicate the sequence for maintenance and servicing procedures.

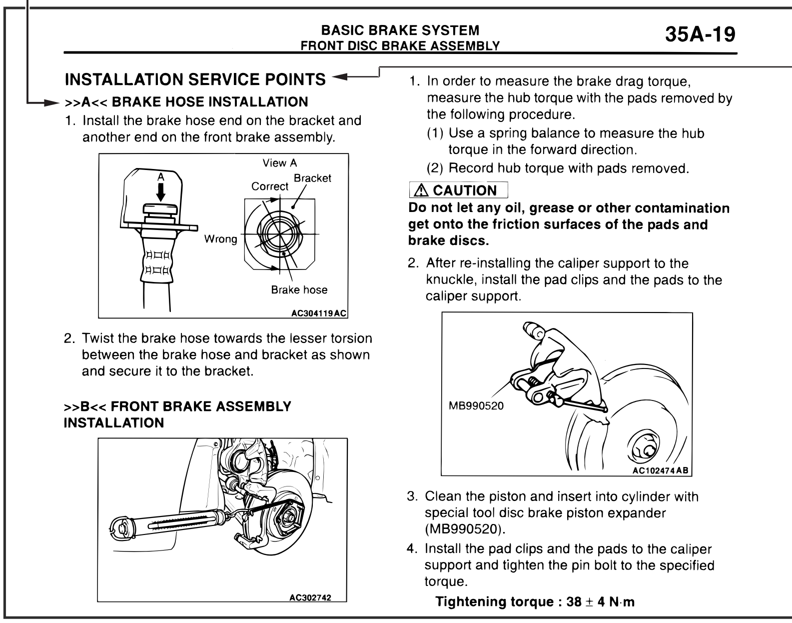
- Removal steps :
  The part designation number corresponds to the number in the illustration to indicate removal steps.
- Disassembly steps :
  The part designation number corresponds to the number in the illustration to indicate disassembly steps.
- Installation steps :
  Specified in case installation is impossible in reverse order of removal steps. Omitted if installation is possible in reverse order of removal steps.
- Reassembly steps :
  Specified in case reassembly is impossible in reverse order of removal steps. Omitted if reassembly is possible in reverse order of disassembly steps.

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Classifications of major maintenance / service points

When there are major points relative to maintenance and servicing procedures (such as essential maintenance and service points, maintenance and service standard values, information regarding the use of special tools, etc.). These are arranged together as major maintenance and service points and explained in detail.

<<A>> : Indicates that there are essential points for removal or disassembly.
>>A<< : Indicates that there are essential points for installation or reassembly.



BASIC BRAKE SYSTEM
FRONT DISC BRAKE ASSEMBLY
35A-19

INSTALLATION SERVICE POINTS

>>A<< BRAKE HOSE INSTALLATION

1. Install the brake hose end on the bracket and another end on the front brake assembly.

2. Twist the brake hose towards the lesser torsion between the brake hose and bracket as shown and secure it to the bracket.

>>B<< FRONT BRAKE ASSEMBLY INSTALLATION

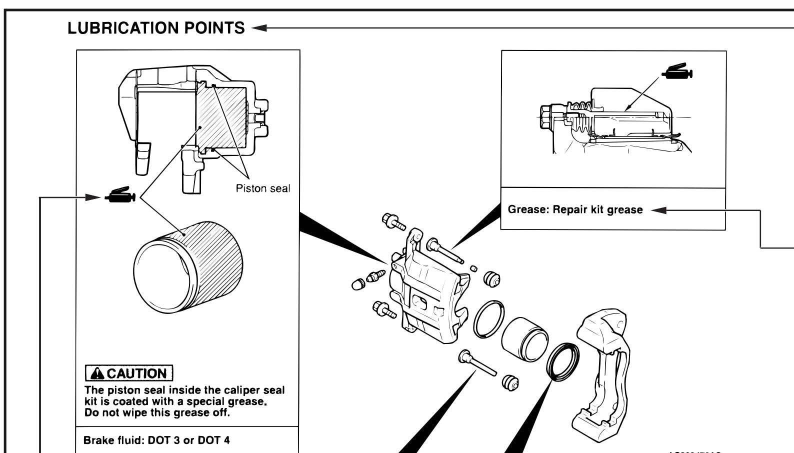
1. In order to measure the brake drag torque, measure the hub torque with the pads removed by the following procedure.
   (1) Use a spring balance to measure the hub torque in the forward direction.
   (2) Record hub torque with pads removed.

⚠ CAUTION
Do not let any oil, grease or other contamination get onto the friction surfaces of the pads and brake discs.

2. After re-installing the caliper support to the knuckle, install the pad clips and the pads to the caliper support.
3. Clean the piston and insert into cylinder with special tool disc brake piston expander (MB990520).
4. Install the pad clips and the pads to the caliper support and tighten the pin bolt to the specified torque.

Tightening torque : 38 ± 4 N·m

Operating procedures, cautions, etc. on removal, installation, disassembly and reassembly are described



LUBRICATION POINTS

The title of the page (following the page on which the diagram of component parts is presented) indicating the locations of lubrication and sealing procedures.

Indicates (by symbols) where lubrication is necessary.

Symbols for lubrication, sealants and adhesives

Symbols are used to show the locations for lubrication and for application of sealants and adhesives. These symbols are included in the diagram of component parts or on the page following the component parts page. The symbols do not always have accompanying text to support that symbol.

- : Grease (Multi-purpose grease unless there is a brand or type specified)
- : Sealant or adhesive
- : Brake fluid or automatic transmission fluid
- : Engine oil, gear oil or air conditioning compressor oil
- : Adhesive tape or butyl rubber tape

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HOW TO USE TROUBLESHOOTING/INSPECTION SERVICE POINTS

CONTENTS OF TROUBLESHOOTING

M1001013300028

⚠ CAUTION

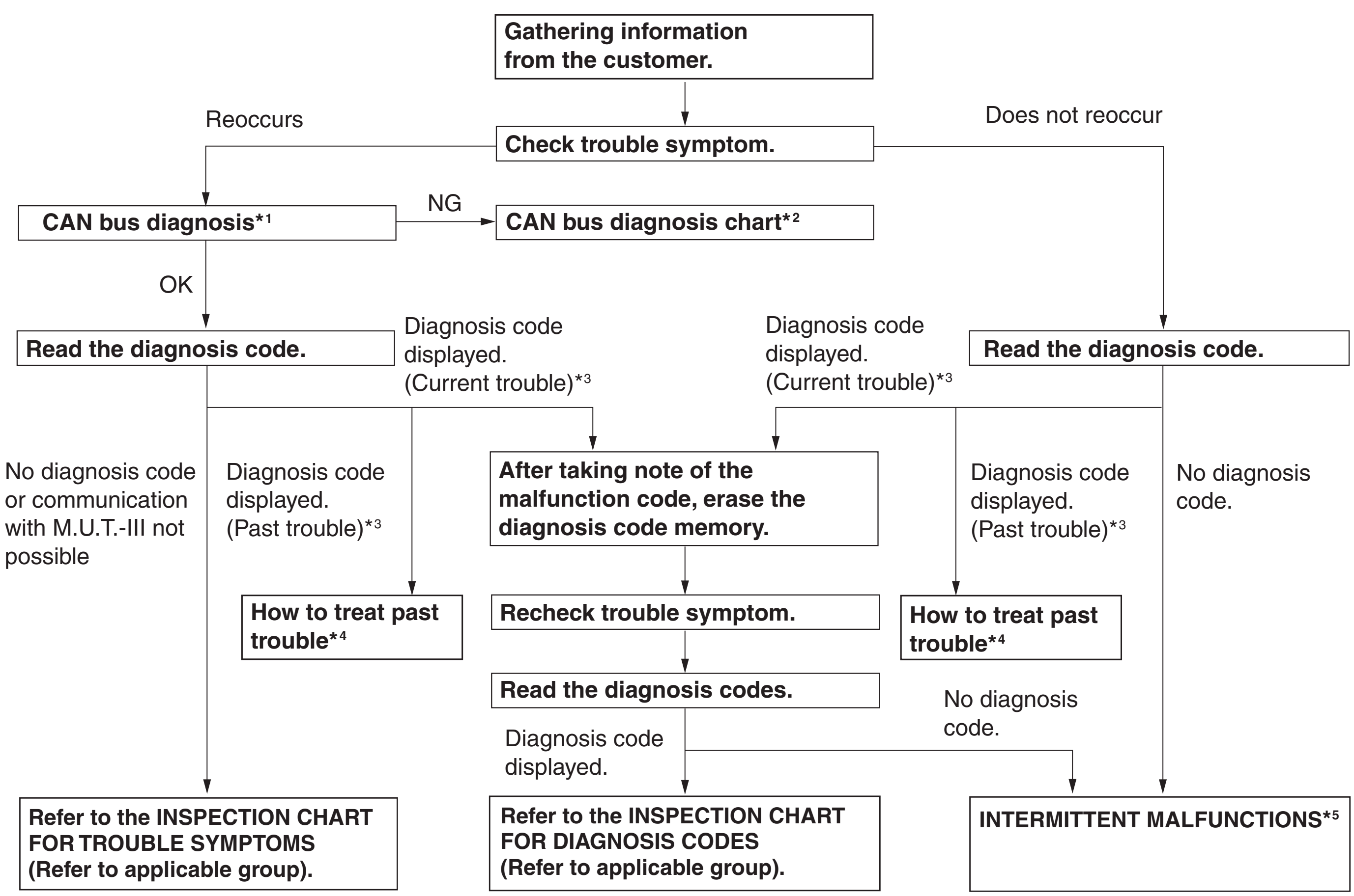
During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Troubleshooting of electronic control systems for which the M.U.T.-III can be used follows the basic outline described below. Even in systems for which the M.U.T.-III cannot be used, some of these systems still follow this outline.

1. STANDARD FLOW OF DIAGNOSIS TROUBLESHOOTING

Troubleshooting sections are based on the diagnostic flow as below. If the diagnostic flow is different from that given below, or if additional explanation is required, the details of such differences or additions will also be listed.

Diagnosis method



AC505173

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- *1: For how to diagnose CAN bus lines, refer to GROUP 54D P.54D-7.
- *2: For the CAN bus diagnosis chart, refer to GROUP 54D P.54D-13.
- *3: When the M.U.T.-III detects a diagnosis code, its display informs users whether a mechanical problem currently exists or whether it existed before. The message for the former state identifies it as a "Active" and the message for the latter identifies it as a "Stored".
- *4: For how to treat past trouble, refer to P.00-13.
- *5: For how to cope with intermittent malfunctions, refer to P.00-13.

2. SYSTEM OPERATION AND SYMPTOM VERIFICATION TESTS

If verification of the symptom(s) is difficult, procedures for checking operation and verifying symptoms are shown.

3. DIAGNOSIS FUNCTION

Details which are different from those in the "Diagnosis Function P.00-7" section are described.

4. DIAGNOSIS CODE CHART

Diagnostic trouble codes and diagnostic items are shown.

5. DIAGNOSIS CODE PROCEDURES

Indicates the inspection procedures corresponding to each diagnosis code (Refer to How to Use Inspection Procedures P.00-8).

6. TROUBLE SYMPTOM CHART

If there are trouble symptoms even though the M.U.T.-III does not find any diagnosis codes, Inspection procedures for each trouble symptom will be found by means of this chart.

7. SYMPTOM PROCEDURES

Indicates the inspection procedures corresponding to each symptoms classified in the Symptom Chart (Refer to How to Use Inspection Procedures P.00-8).

8. SERVICE DATA REFERENCE TABLE

Inspection items and normal judgment values have been provided in this chart as reference information.

9. ACTUATOR TEST TABLE

The Actuator Test item numbers, inspection items, and judgment values have been provided in this chart as reference information.

10. CHECK AT ECU TERMINALS

Terminal numbers for the ECU connectors, inspection items, and judgment values have been provided in this chart as reference information.

11. INSPECTION PROCEDURE BY USING AN OSCILLOSCOPE

When there are inspection procedures using an oscilloscope, these are described here.

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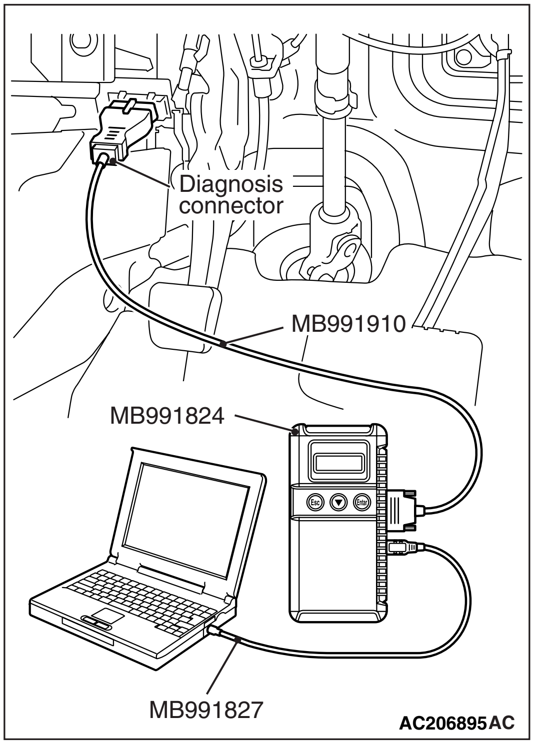
DIAGNOSIS FUNCTION

M1001013400025

HOW TO READ DIAGNOSIS CODE

⚠ CAUTION

Before connecting or disconnecting the M.U.T.-III, turn the ignition switch to the "LOCK" (OFF) position.



Connect the M.U.T.-III to the 16-pin diagnosis connector, and read the diagnosis code.

NOTE: . For details on how to use the M.U.T.-III, refer to the "M.U.T.-III operation manual."

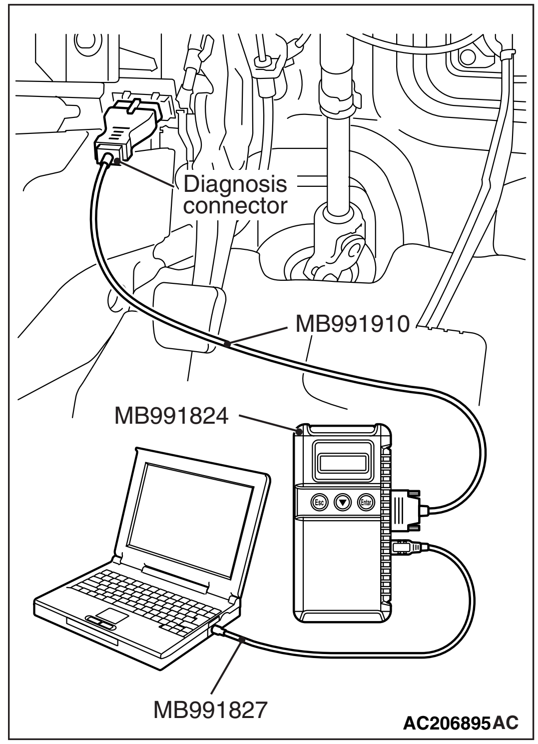
1. Ensure that the ignition switch is at the "LOCK" (OFF).
2. Start up the personal computer.
3. Connect M.U.T.-III USB cable (MB991827) to special tool Vehicle Communication Interface (V.C.I.) (MB991824) and the personal computer.
4. Connect M.U.T.-III main harness A (MB991910) to the V.C.I.
5. Connect the M.U.T.-III main harness A to the diagnosis connector.
6. Turn the V.C.I. power switch to the "ON" position.

   NOTE: . When the V.C.I. is energized, the V.C.I. indicator lamp will be illuminated in a green colour.
7. Start the M.U.T.-III system on the personal computer and turn the ignition switch to the "ON" position.
8. Read the diagnosis code.
9. Disconnecting the M.U.T.-III is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF).

ERASING DIAGNOSIS CODE

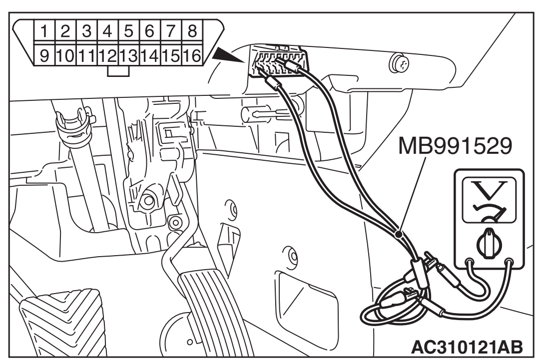
⚠ CAUTION

Before connecting or disconnecting the M.U.T.-III, turn the ignition switch to the "LOCK" (OFF) position.



Connect the M.U.T.-III to the diagnosis connector, and erase the diagnosis code. The procedure is the same as "How to Read Diagnosis Code."

INPUT SIGNAL CHECK (WHEN USING A VOLTMETER) <SWS>



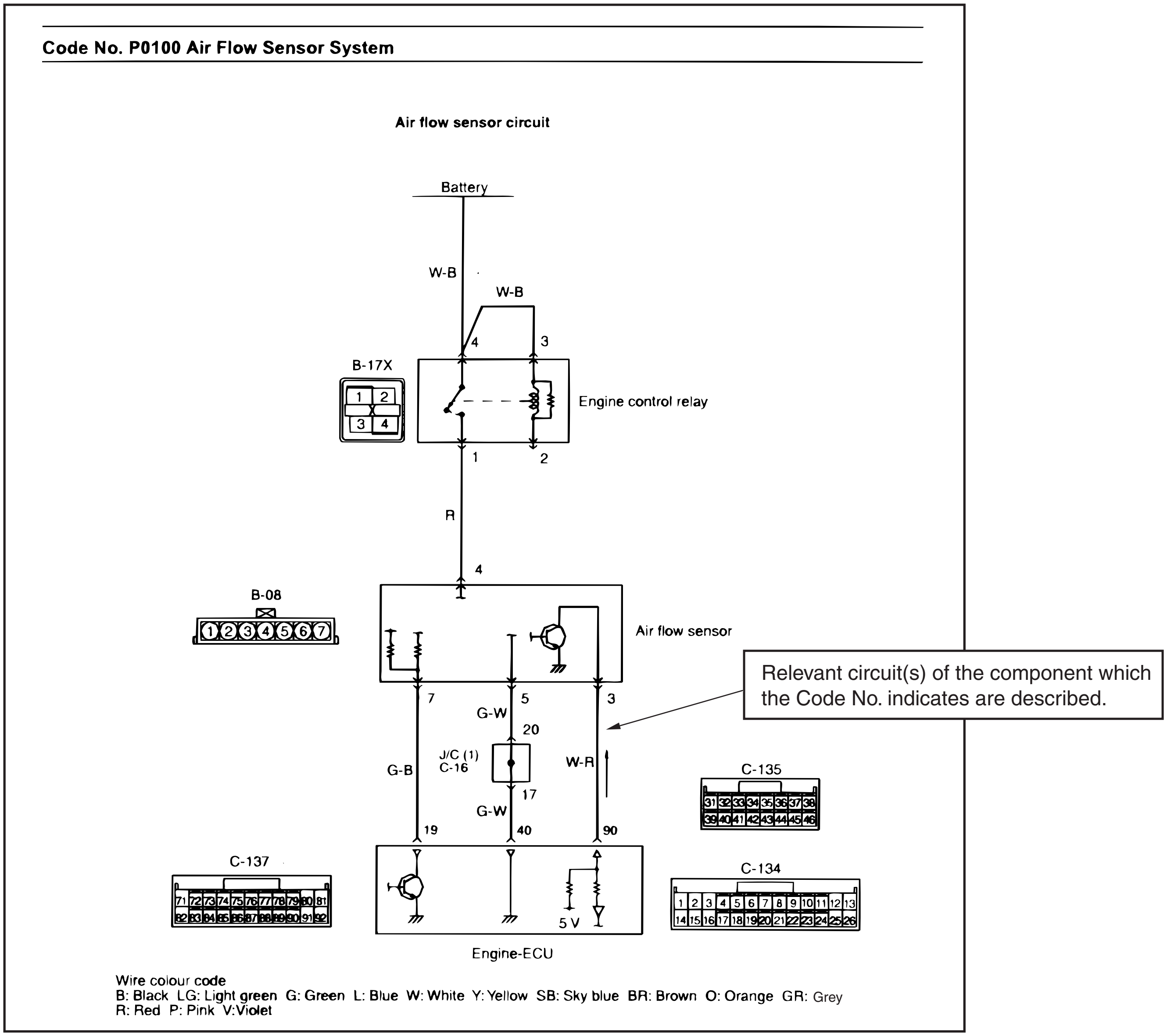
1. Use special tool diagnosis code check harness (MB991529) to connect the ETACS terminal (terminal 9) and the earth terminals (terminals 4 and 5) of the diagnosis connector to the voltage meter.
2. If the needle of the voltage meter flickers once when each switch is operated (ON/OFF), the input signal for that switch circuit system is normal.

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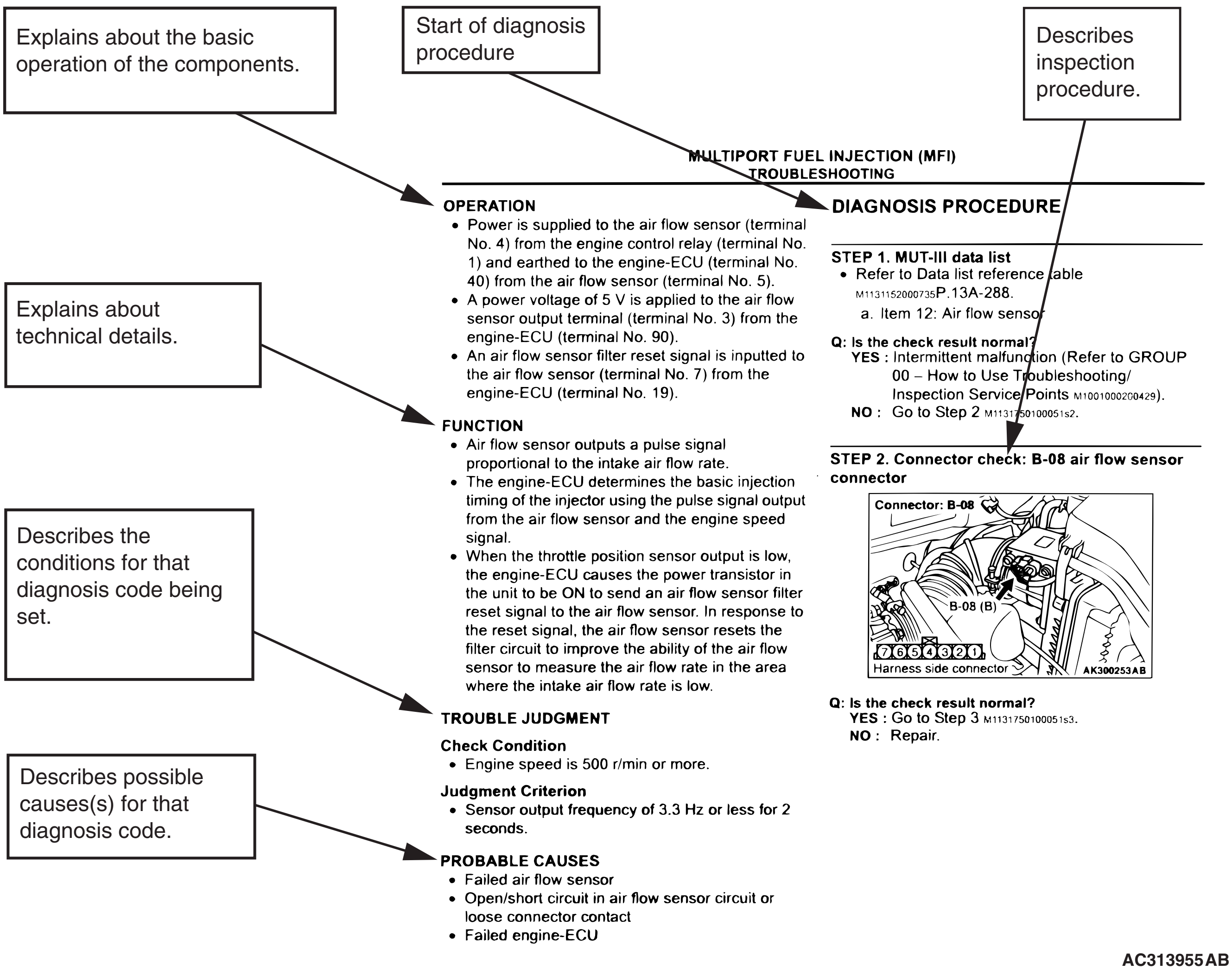
HOW TO USE THE INSPECTION PROCEDURES

M1001013500367

The causes of many of the problems occurring in electric circuitry are generally the connectors, components, the ECU, the wiring harnesses between connectors, in that order. These inspection procedures follow this order. They first try to discover a problem with a connector or a defective component.



AC301964 AC



MULTIPORT FUEL INJECTION (MFI)
TROUBLESHOOTING

OPERATION
- Power is supplied to the air flow sensor (terminal No. 4) from the engine control relay (terminal No. 1) and earthed to the engine-ECU (terminal No. 40) from the air flow sensor (terminal No. 5).
- A power voltage of 5 V is applied to the air flow sensor output terminal (terminal No. 3) from the engine-ECU (terminal No. 90).
- An air flow sensor filter reset signal is inputted to the air flow sensor (terminal No. 7) from the engine-ECU (terminal No. 19).

FUNCTION
- Air flow sensor outputs a pulse signal proportional to the intake air flow rate.
- The engine-ECU determines the basic injection timing of the injector using the pulse signal output from the air flow sensor and the engine speed signal.
- When the throttle position sensor output is low, the engine-ECU causes the power transistor in the unit to be ON to send an air flow sensor filter reset signal to the air flow sensor. In response to the reset signal, the air flow sensor resets the filter circuit to improve the ability of the air flow sensor to measure the air flow rate in the area where the intake air flow rate is low.

TROUBLE JUDGMENT

Check Condition
- Engine speed is 500 r/min or more.

Judgment Criterion
- Sensor output frequency of 3.3 Hz or less for 2 seconds.

PROBABLE CAUSES
- Failed air flow sensor
- Open/short circuit in air flow sensor circuit or loose connector contact
- Failed engine-ECU

DIAGNOSIS PROCEDURE

STEP 1. MUT-III data list
- Refer to Data list reference table M1131152000735P.13A-288.
  a. Item 12: Air flow sensor

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points M1001000200429).
NO : Go to Step 2 M1131750100051s2.

STEP 2. Connector check: B-08 air flow sensor connector

Q: Is the check result normal?
YES : Go to Step 3 M1131750100051s3.
NO : Repair.

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CURRENT TROUBLE

Indicates that the status is "Active" and the trouble is currently present. Carry out troubleshooting as described in the applicable inspection procedure.

PAST TROUBLE

Indicates that the status is "Stored" and the trouble is historic. Since the trouble may still be present, set the vehicle to the diagnosis code detection condition and check that the status changes to "Active". If the status does not change from "Stored", observe the applicable inspection procedure with particular emphasis on connector(s) and wiring harness.

HARNESS CHECK

Check for an open or short circuit in the harness between the terminals which are faulty according to the connector measurements. Carry out this inspection while referring to the Electrical Wiring Manual. Here, "Check the wiring harness between the power supply and terminal xx" also includes checking for blown fuse. For inspection service points when there is a blown fuse, refer to "Inspection Service Points for a Blown Fuse P.00-12."

MEASURES TO TAKE AFTER REPLACING THE ECU

If the trouble symptoms have not disappeared even after replacing the ECU, repeat the inspection procedure from the beginning.

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CONNECTOR MEASUREMENT SERVICE POINTS

M1001013600397

⚠ CAUTION

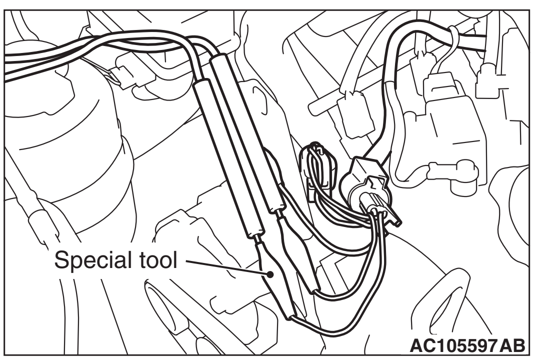
During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Turn the ignition switch to the "LOCK" (OFF) position when connecting and disconnecting the connectors. Turn the ignition switch to "ON" when measuring, unless there are instructions to the contrary.

IF INSPECTING WITH THE CONNECTOR CONNECTED <WATERPROOF CONNECTORS>

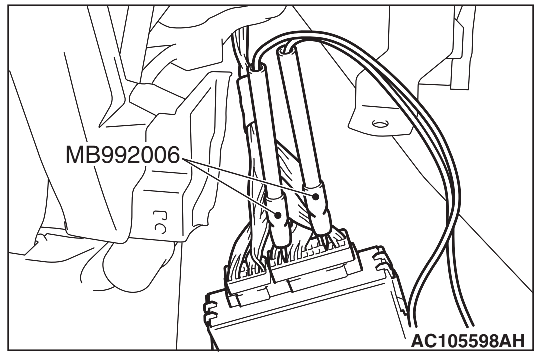
⚠ CAUTION

Never insert a test probe from the harness side, as this will reduce the waterproof performance and result in corrosion.



Use the special tools such as test harness, harness connector or check harness.

IF INSPECTING WITH THE CONNECTOR CONNECTED <ORDINARY (NON-WATER-PROOF) CONNECTORS>

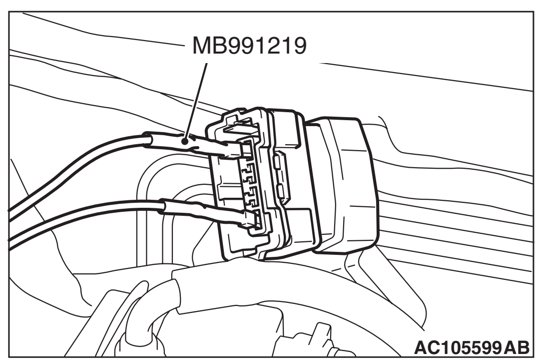


Insert a test bar from the wiring harness side. If a test bar cannot be inserted due to a too small pin cell (e.g. control unit connector pins), use special tool extra fine probe (MB992006). Never attempt to insert the test bar into a too small pin cell forcibly.

IF INSPECTING WITH THE CONNECTOR DISCONNECTED <WHEN INSPECTING A FEMALE PIN>

⚠ CAUTION

- **Use special tool check harness (MB991219). If the test bar is inserted forcibly, it will cause a poor contact.**
- **If the connector is disconnected, a diagnosis code may be stored for the system to be checked or other systems.**



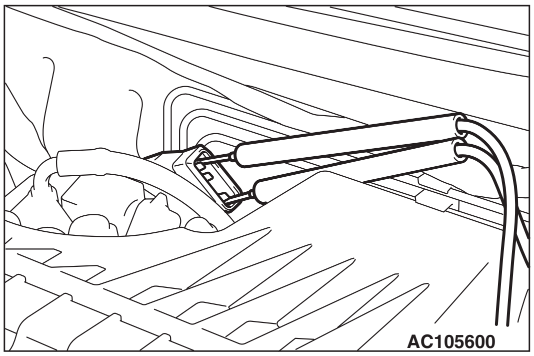
Use check harness (MB991219) of special tool harness set (MB991223).

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IF INSPECTING WITH THE CONNECTOR DISCONNECTED <WHEN INSPECTING A MALE PIN>

⚠ CAUTION

- **Be careful not to short the connector pins with the test bars. To do so may damage the circuits inside the ECU.**
- **If the connector is disconnected, a diagnosis code may be stored for the system to be checked or other systems.**

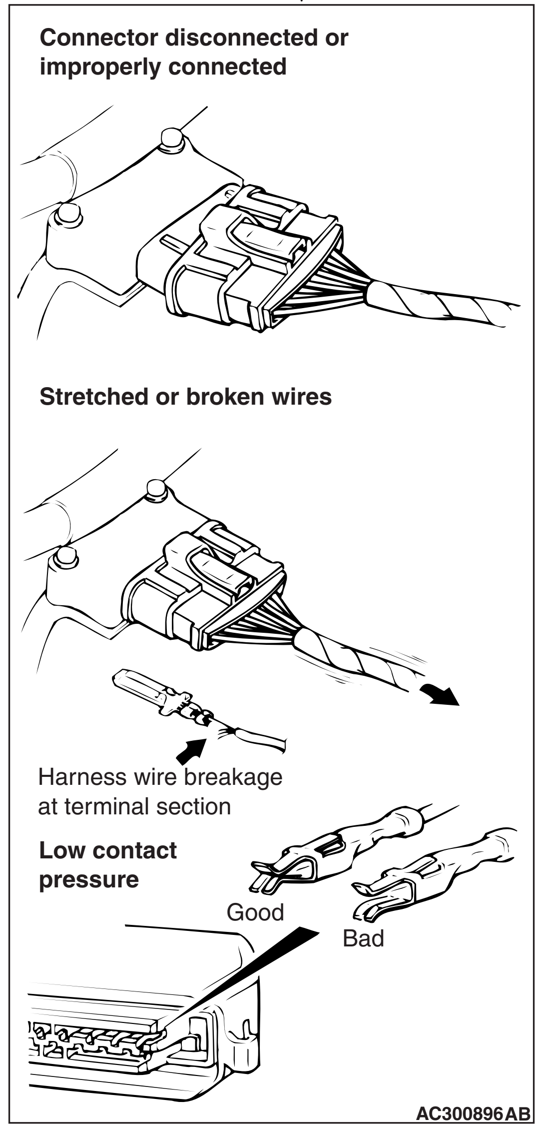


Touch the pin directly with the test bar.

CONNECTOR INSPECTION SERVICE POINTS

M1001013700026

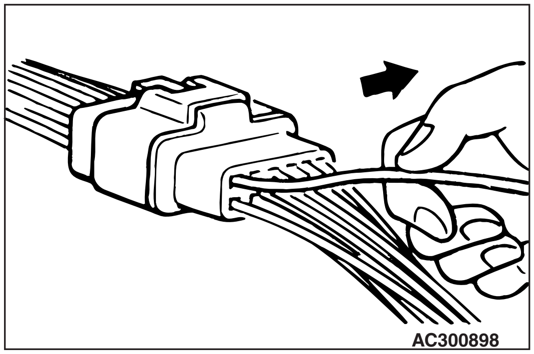
VISUAL INSPECTION



Connector is disconnected or improperly connected

- Connector pins are pulled out
- Due to harness tension at terminal section
- Low contact pressure between male and female terminals
- Low connection pressure due to rusted terminals or foreign matter lodged in terminals

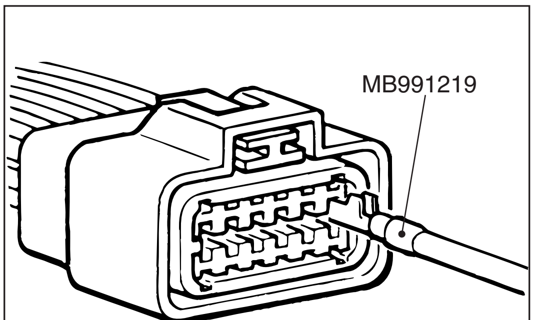
CONNECTOR PIN INSPECTION



AC300898

If the connector pin stopper is damaged, the terminal connections (male and female pins) will not be perfect even if the connector body is connected, and the pins may pull out of the reverse side of the connector. Therefore, gently pull the harnesses one by one to make sure that no pins pull out of the connector.

CONNECTOR ENGAGEMENT INSPECTION



AC300899AB

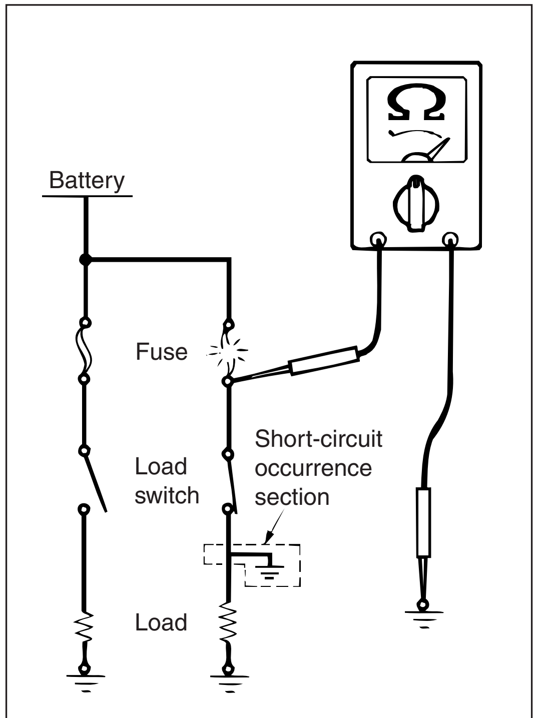
Use special tool inspection harness (MB991219) (connector pin connection pressure inspection harness of the inspection harness set) to inspect the engagement of the male pins and female pins. (Pin drawing force: 1 N or more)

INSPECTION SERVICE POINTS FOR A BLOWN FUSE

M1001013800023

⚠ CAUTION

A diagnosis code may be stored due to a blown fuse.



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Remove the blown fuse and measure the resistance between the load side of the blown fuse and the earth. Close the switches of all circuits which are connected to this fuse. If the resistance is almost 0 Ω at this time, there is a short somewhere between these switches and the load. If the resistance is not 0 Ω, there is no short at the present time, but a momentary short has probably caused the fuse to blow.

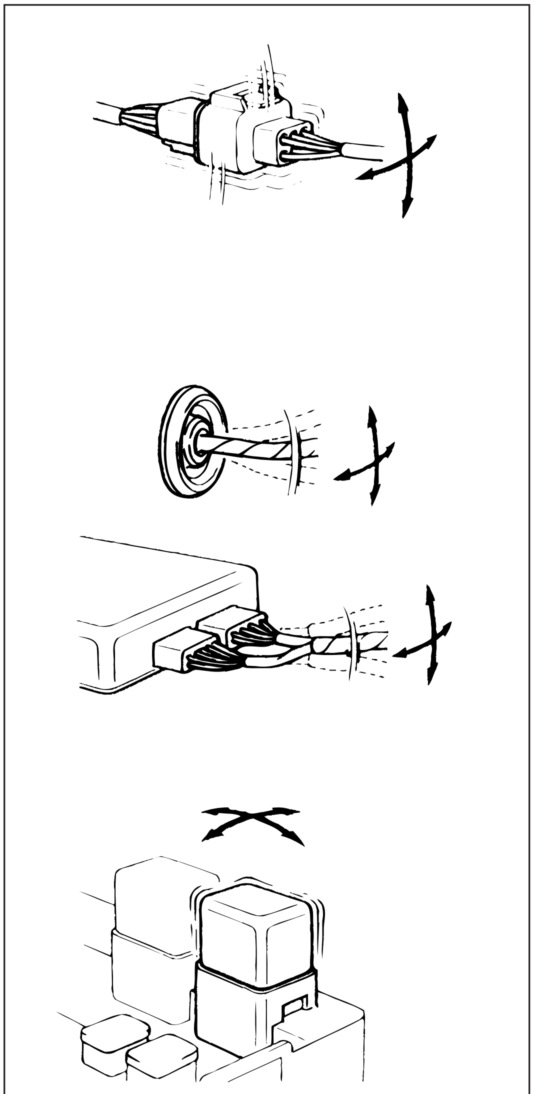
The main causes of a short circuit are the following.

- Harness being clamped by the vehicle body
- Damage to the outer casing of the harness due to wear or heat
- Water getting into the connector or circuitry
- Human error (mistakenly shorting a circuit, etc.)

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HOW TO COPE WITH INTERMITTENT MALFUNCTIONS

M1001013900020



AC300901

Intermittent malfunctions often occur under certain conditions, and if these conditions can be ascertained, determining the cause becomes simple. In order to ascertain the conditions under which an intermittent malfunction occurs, first ask the customer for details about the driving conditions, weather conditions, frequency of occurrence and trouble symptoms, and then try to recreate the trouble symptoms. Next, ascertain whether the reason why the trouble symptom occurred under these conditions is due to vibration, temperature or some other factor. If vibration is thought to be the cause, carry out the following checks with the connectors and components to confirm whether the trouble symptom occurs. The objects to be checked are connectors and components which are indicated by inspection procedures or given as probable causes (which generates diagnosis codes or trouble symptoms).

- Gently shake the connector up, down and to the left and right.
- Gently shake the wiring harness up, down and to the left and right.
- Gently rock each sensor and relay, etc. by hand.
- Gently shake the wiring harness at suspensions and other moving parts.

NOTE: If determining the cause is difficult, the drive recorder function of the M.U.T.-III can also be used. (For details on how to use the M.U.T.-III, refer to the "M.U.T.-III operation manual).

HOW TO TREAT PAST TROUBLE

M1001014100027

Since the trouble may still be present even the status is "Stored", set the vehicle to the diagnosis code detection condition and check that the status changes to "Active". If the status does not change from "Stored", carry out the following procedure.

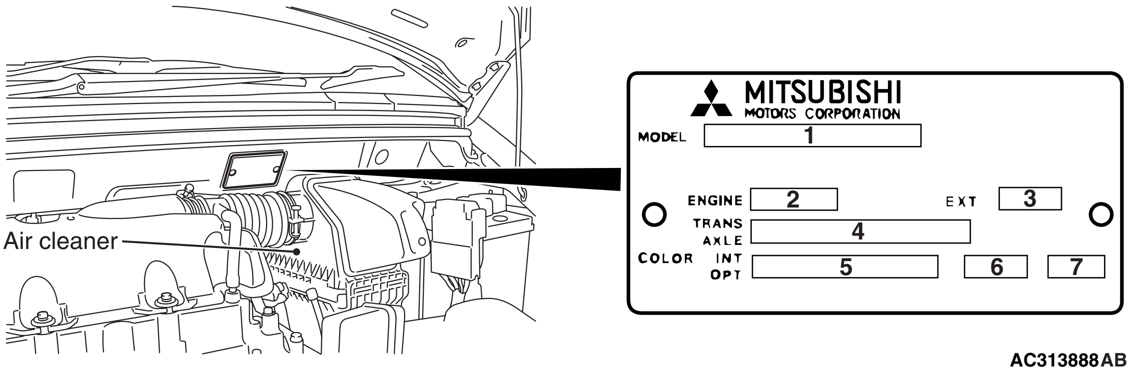
1. Establish from the customer whether a fuse or connector has been replaced or disconnected.
2. If yes, erase the diagnosis code, and then check that no diagnostic code is reset. If no diagnosis code is reset, the diagnosis is complete.
3. If no, follow the applicable Diagnostic Trouble Code Chart. Then check the wiring harness and connector, and refer to "How to Cope with Intermittent Malfunction P.00-13 ."

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VEHICLE IDENTIFICATION

M1001000401727

VEHICLE IDENTIFICATION CODE PLATE



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The vehicle identification code plate is riveted onto the cowl top panel in the engine compartment. The plate shows model code, engine model, transmission model and body colour code.

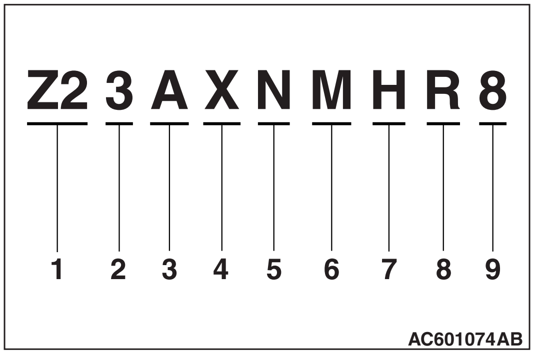
No.	Item	Sample	Content
1	MODEL	Z23AXSMHR8	Z23A: Vehicle model
			XSMHR8: Model series
2	ENGINE	4A91	Engine model
3	EXT	A19A	Exterior code
4	TRANS AXLE	F1C1A	Transmission model
5	COLOUR	A19	Body colour code
6	INT	240	Interior code
7	OPT	Y05	Equipment code

For monotone colour vehicles, the body colour code shall be indicated.

MODELS

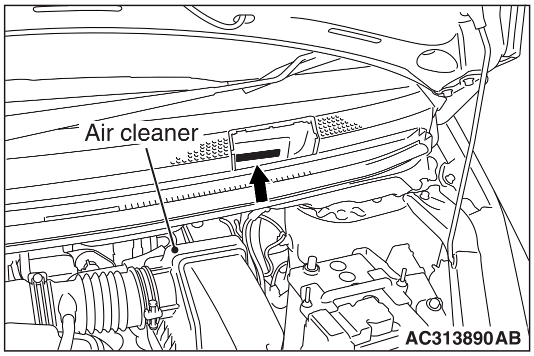
Model code		Price class	Engine model	Transmission model	Fuel supply system
Z23A	XNMHR8	ES, LS	4A91 DOHC MIVEC (1,499 mL)	F5MGA (5-speed M/T, floor shift)	MPI
	XNXHR8	VR-X			
	XSMHR8	LS		F1C1A (INVECS-III CVT, smart shift)	
	XSXHR8	VR-X			
Z27A	XNGFR8	RALLIART Version-R	4G15 DOHC MIVEC with Intercooler Turbocharger (1,468 mL)	F5MGB (5-speed M/T, floor shift)	

MODEL CODE

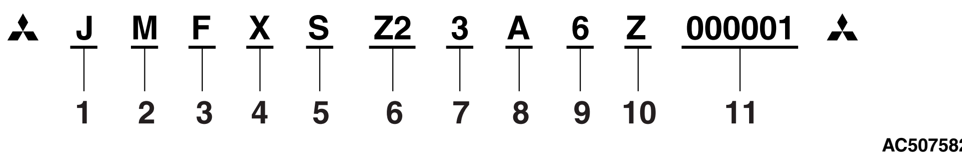


No.	Item		Content
1	Development	Z2	MITSUBISHI COLT
2	Engine type	3	1,499 mL petrol engine (4A91)
		7	1,468 mL petrol engine (4G15)
3	Sort	A	Passenger car
4	Body style	X	4-door hatchback
5	Transmission type	N	Floor shift M/T
		S	Smart shift CVT
6	Trim level	G	RALLIART Version-R
		M	LS
		X	VR-X
7	Specification engine feature	F	DOHC-MPI-MIVEC with Intercooler Turbocharger
		H	DOHC-MPI-MIVEC
8	Steering wheel location	R	Right hand drive
9	Destination	8	For Australia and New Zealand

CHASSIS NUMBER



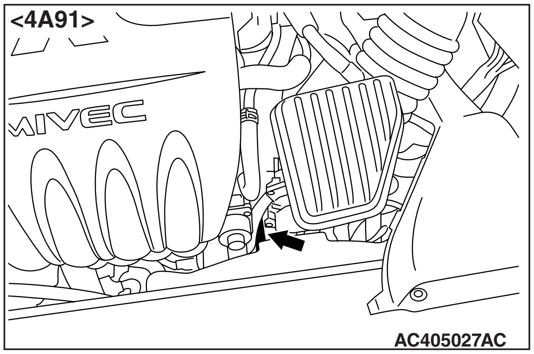
The chassis number is stamped on the cowl top panel side in the engine compartment.

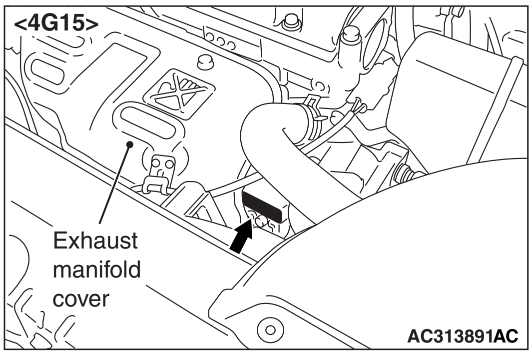


No.	Item		Content
1	Fixed figure	J	Asia
2	Distribution channel	M	Japan channel
3	Destination	A	For New Zealand
		F	For Australia
4	Body style	X	4-door hatchback
5	Transmission type	N	Floor shift M/T
		S	Smart shift CVT
6	Development order	Z2	MITSUBISHI COLT
7	Engine	3	1,499 mL petrol engine (4A91)
		7	1,468 mL petrol engine (4G15)
8	Soft	A	Passenger car
9	Model year	6	2006
10	Plant	Z	Okazaki Motor Vehicle Works
11	Serial number	–	–

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ENGINE MODEL STAMPING





The engine model is stamped on the cylinder block. This engine model numbers are shown as follows.

Engine model	Engine displacement
4A91	1,499 mL
4G15	1,468 mL

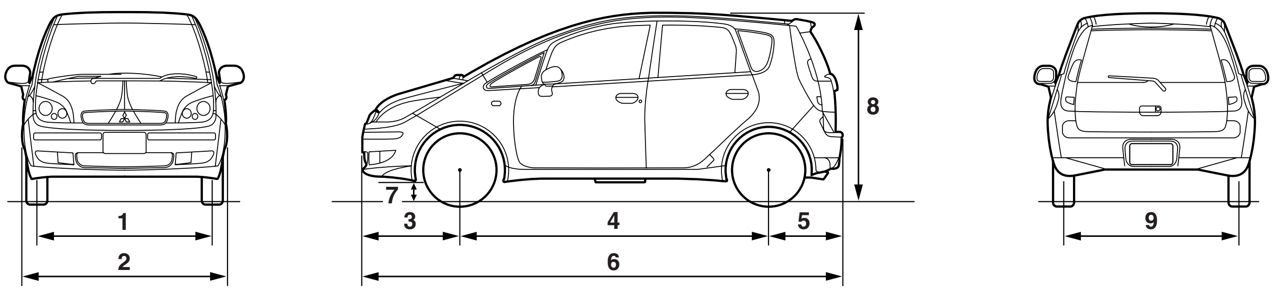
The engine serial number is stamped near the engine model number.

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GENERAL DATA AND SPECIFICATIONS

M1001000901487

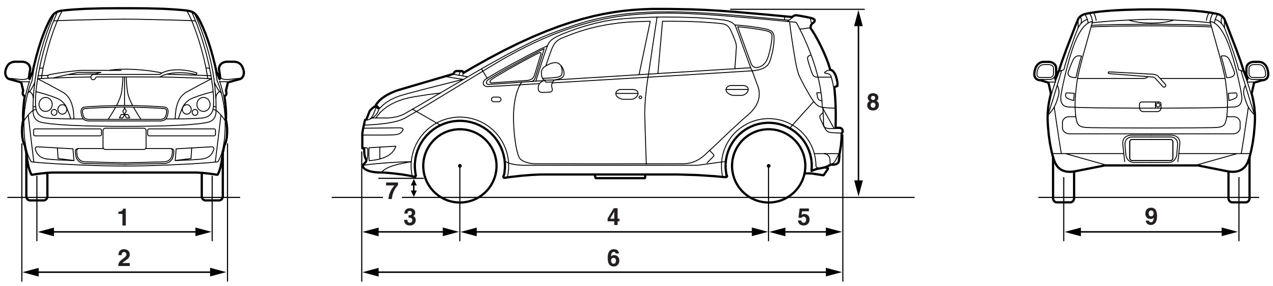
<CVT>



AC401657AB

Item			Z23A	
			XSMHR8	XSXHR8
			LS	VR-X
Vehicle dimensions mm	Front track	1	1,460	
	Overall width	2	1,680	
	Front overhang	3	790	
	Wheel base	4	2,500	
	Rear overhang	5	590	
	Overall length	6	3,885	
	Ground clearance (unladen)	7	150	
	Overall height (unladen)	8	1,550	
	Rear track	9	1,445	
Vehicle weight kg	Kerb weight		1,050	1,065
	Max. gross vehicle weight		1,490	
	Max. axle weight rating-front		810	
	Max. axle weight rating-rear		700	
Seating capacity			5	
Engine	Model code		4A91	
	Total displacement mL		1,499	
Transmission	Model code		F1C1A	
	Type		Smart shift CVT	
Fuel system	Fuel supply system		MPI	

<M/T>



AC401657AB

Item			Z23A		Z27A
			XNMHR8	XNXHR8	XNGFR8
			ES, LS	VR-X	RALLIART Version-R
Vehicle dimensions mm	Front track	1	1,460		1,465
	Overall width	2	1,680		1,695
	Front overhang	3	790		810
	Wheel base	4	2,500		
	Rear overhang	5	590		615
	Overall length	6	3,885		3,925
	Ground clearance (unladen)	7	150		
	Overall height (unladen)	8	1,550		
	Rear track	9	1,445		1,450
Vehicle weight kg	Kerb weight		1,020	1,035	1,130
	Max. gross vehicle weight		1,460		1,470
	Max. axle weight rating-front		780		850
	Max. axle weight rating-rear		700		640
Seating capacity			5		4
Engine	Model code		4A91		4G15 (with intercooler, turbocharger)
	Total displacement mL		1,499		1,468
Transmission	Model code		F5MGA		F5MGB
	Type		Floor shift M/T		
Fuel system	Fuel supply system		MPI		

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PRECAUTIONS BEFORE SERVICE

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) AND SEAT BELT WITH PRE-TENSIONER

M1001011600379

⚠ CAUTION

Items to review when servicing SRS:

1. **Be sure to read GROUP 52B – Supplemental Restraint System (SRS). For safe operation, please follow the directions and heed all warnings.**
2. **Wait at least 60 seconds after disconnecting the battery cable before doing any further work. The SRS system is designed to retain enough voltage to deploy the air bag even after the battery has been disconnected. Serious injury may result from unintended air bag deployment if work is done on the SRS system immediately after the battery cable is disconnected.**
3. **Warning labels must be heeded when servicing or handling SRS components. Warning labels can be found in the following locations.**
   - **Steering wheel**
   - **Driver's air bag module**
   - **Clock spring**
   - **Passenger's (front) air bag module**
   - **SRS-ECU**
   - **Sun visor**
   - **Seat belt with pre-tensioner [Driver's and passenger's (front) seat]**
   - **Hood**
   - **Front impact sensor**
   - **Instrument panel**
   - **Side air bag module**
   - **Curtain air bag module**
4. **Always use the designated special tools and test equipment.**
5. **Store components removed from the SRS in a clean and dry place. The air bag module should be stored on a flat surface and placed so that the pad surface is facing upward. Do not place anything on top of it.**
6. **Never attempt to disassemble or repair the SRS components (SRS-ECU, air bag modules and clock spring).**
7. **Whenever you finish servicing the SRS, check the SRS warning lamp operation to make sure that the system functions properly.**
8. **Be sure to deploy the air bag before disposing of the air bag module or disposing of a vehicle equipped with an air bag (Refer to GROUP 52B – Air Bag Module Disposal Procedures).**

Observe the following when carrying out operations on places where SRS components are installed, including operations not directly related to the SRS air bag.

1. **When removing or installing parts, do not allow any impact or shock to the SRS components.**
2. **If heat damage may occur during paint work, remove the SRS-ECU, the air bag modules, clock spring, the impact sensors and the seat belt with pre-tensioner.**
   - **SRS-ECU, air bag modules, clock spring and impact sensors: 93 °C or more**
   - **Seat belt with pre-tensioner: 90 °C or more**

INITIALIZATION PROCEDURE FOR LEARNING VALUE IN MPI ENGINE

M1001011700031

INITIALIZATION PROCEDURE

1. After the ignition switch is in "LOCK" (OFF) position, connect M.U.T.-III with the diagnosis connector.
2. Select the item on the screen of the initialisation for learning, and perform the initialisation.

Service	Item
At replacing engine assembly *1,*2	All ranges
_ *3	Misfire-related
At replacing injector and at cleaning *2	Learning value for air/fuel ratio
At replacing throttle body and at cleaning *2	Idle speed control-related
At replacing detonation sensor	Learning value for knocking

*NOTE: *1: Initialise CVT-related learning value.*

*NOTE: *2: After initialising the learning value, the idling learning in MPI engine is required (Refer to LEARNING PROCEDURE FOR IDLING IN MPI ENGINE P.00-21).*

*NOTE: *3: The datum items on M.U.T.-III display are shown, but do not use them.*

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LEARNING PROCEDURE FOR IDLING IN MPI ENGINE

M1001011800492

PURPOSE

When the engine-ECU <M/T> or the engine-CVT-ECU <A/T> is replaced, or when the learning value is initialised, the idling is not stabilized because the learning value in MPI engine is not completed. In this case, carry out the learning method for the idling through the following procedures.

LEARNING PROCEDURE

1. Start the engine and carry out the warm-up for the engine coolant temperature to reach 80°C or more.
2. When the engine coolant temperature is 80°C or more, the warm-up is not needed if the ignition switch is in "ON" position once.
3. Place the ignition switch in "LOCK" (OFF) position and stop the engine.
4. After 10 seconds or more, start the engine again.
5. For 10 minutes, carry out the idling under the condition shown below and then confirm the engine has the normal idling.

- Transmission: Neutral (A/T: "P" range)
- Operation in ignition-related, fan and attachments: Not to be operated
- Engine coolant temperature: 80°C or more

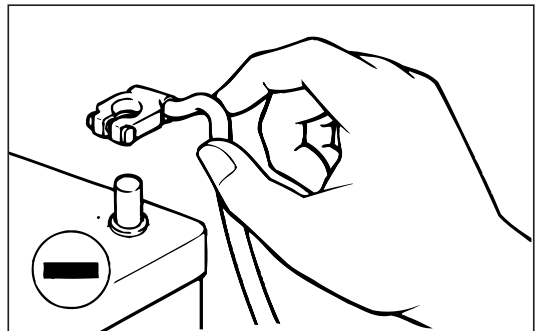
NOTE: When the engine stalls during the idling, check the dirtiness (on the throttle valve) of the throttle body and then perform the service from Procedure 1 again.

SERVICING ELECTRICAL SYSTEM

M1001011900035

⚠ CAUTION

Before connecting or disconnecting the negative (–) cable, be sure to turn off the ignition switch and the lighting switch (If this is not done, there is the possibility of semiconductor parts being damaged).


AC300693

Before replacing a component related to the electrical system and before undertaking any repair procedures involving the electrical system, be sure to first disconnect the negative (–) cable from the battery in order to avoid damage caused by short-circuiting.

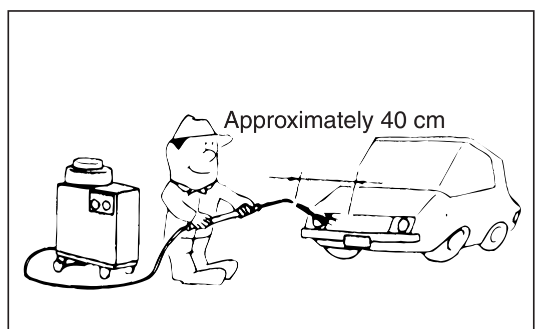
APPLICATION OF ANTI-CORROSION AGENTS AND UNDERCOATS

M1001011000021

If oil or grease gets onto the oxygen sensor, it will cause a drop in the performance of the sensor. Cover the oxygen sensor with a protective cover when applying anti-corrosion agents and undercoats.

VEHICLE WASHING

M1001012000035



AC300832AB

If high-pressure car-washing equipment or steam car-washing equipment is used to wash the vehicle, be sure to note the following information in order to avoid damage to plastic components, etc.

- Spray nozzle distance: Approximately 40 cm or more
- Spray pressure: 3,900 kPa or less
- Spray temperature: 82°C or less
- Time of concentrated spray to one point: within 30 sec.

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PRE-INSPECTION CONDITION

M1001012100247

"Pre-inspection condition" refers to the condition that the vehicle must be in before proper engine inspection can be carried out. If you see the words "Set the vehicle to the pre-inspection condition" in this manual, it means to set the vehicle to the following condition.

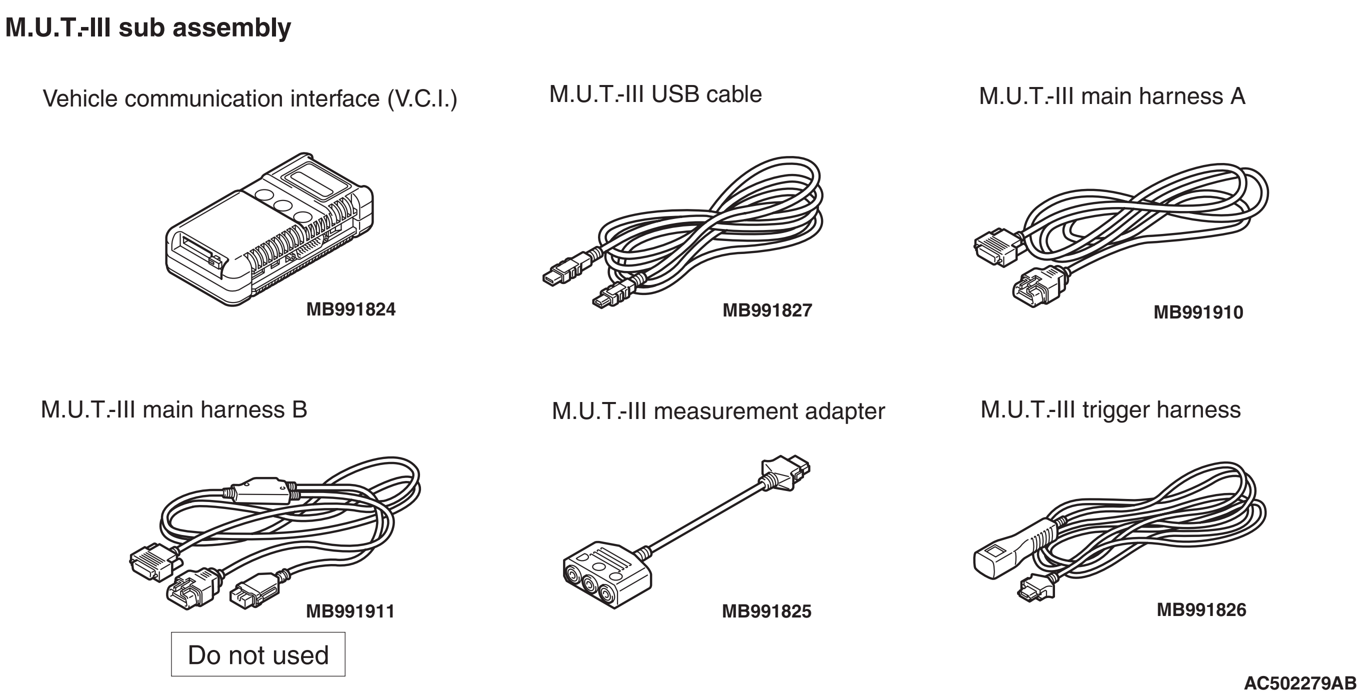
- Engine coolant temperature 80 to 90°C
- Lamps, electric cooling fan and all accessories: OFF
- M/T: Neutral
- A/T: P range

MULTI USE TESTER (M.U.T.-III) SUB ASSEMBLY

M1001012400099

⚠ CAUTION

For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.

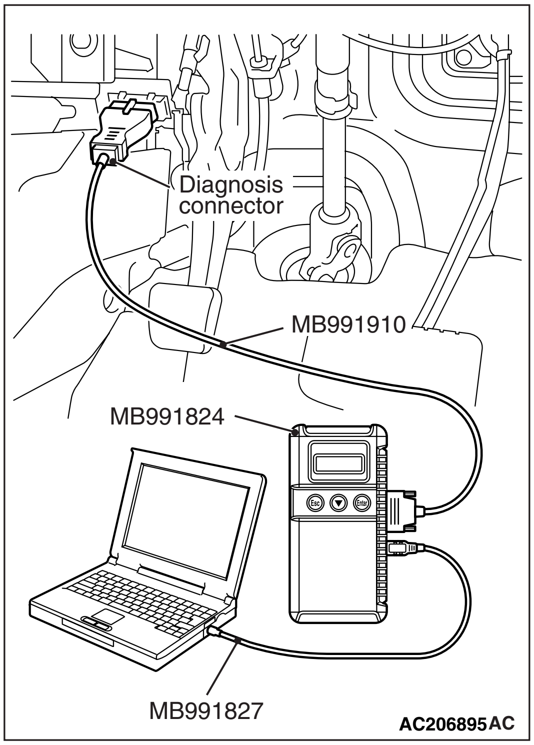


Refer to the "M.U.T.-III OPERATION MANUAL" for instructions on handling the M.U.T.-III.

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⚠ CAUTION

Turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting the M.U.T.-III.



Connect the M.U.T.-III to the diagnosis connector as shown in the illustration.

IN ORDER TO PREVENT VEHICLES FROM FIRE

M1001011100170

"Improper installation of electrical or fuel related parts could cause a fire. In order to retain the high quality and safety of the vehicle, it is important that any accessories that may be fitted or modifications/repairs that may be carried out which involve the electrical or fuel systems, must be carried out in accordance with MMC's Information/Instructions".

ENGINE OIL

M1001011200177

HEALTH WARNING

Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer. Adequate means of skin protection and washing facilities must be provided.

RECOMMENDED PRECAUTIONS

The most effective precaution is to adapt working practices which prevent, as far as practicable, the risk of skin contact with mineral oil, for example by using enclosed systems for handling used engine oil and by degreasing components, where practicable, before handling them.
Other precautions:

- Avoid prolonged and repeated contact with oil, particularly used engine oil.
- Wear protective clothing, including impervious gloves where practicable.
- Avoid contaminating clothes, particularly underpants, with oil.
- Do not put oily rags in pockets, the use of overalls without pockets will avoid this.
- Do not wear heavily soiled clothing and oil-impregnated foot-wear. Overalls must be cleaned regularly and kept separately from personal clothing.
- Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shield; in addition an eye wash facility should be provided.
- Obtain first aid treatment immediately for open cuts and wounds.
- Wash regularly with soap and water to ensure all oil is removed, especially before meal (skin cleansers and nail brushes will help). After cleaning, the application of preparations containing lanolin to replace the natural skin oil is advised.
- Do not use petrol, kerosine, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- Use barrier creams, applying them before each work period, to help the removal of oil from the skin after work.
- If skin disorders develop, obtain medical advice without delay.

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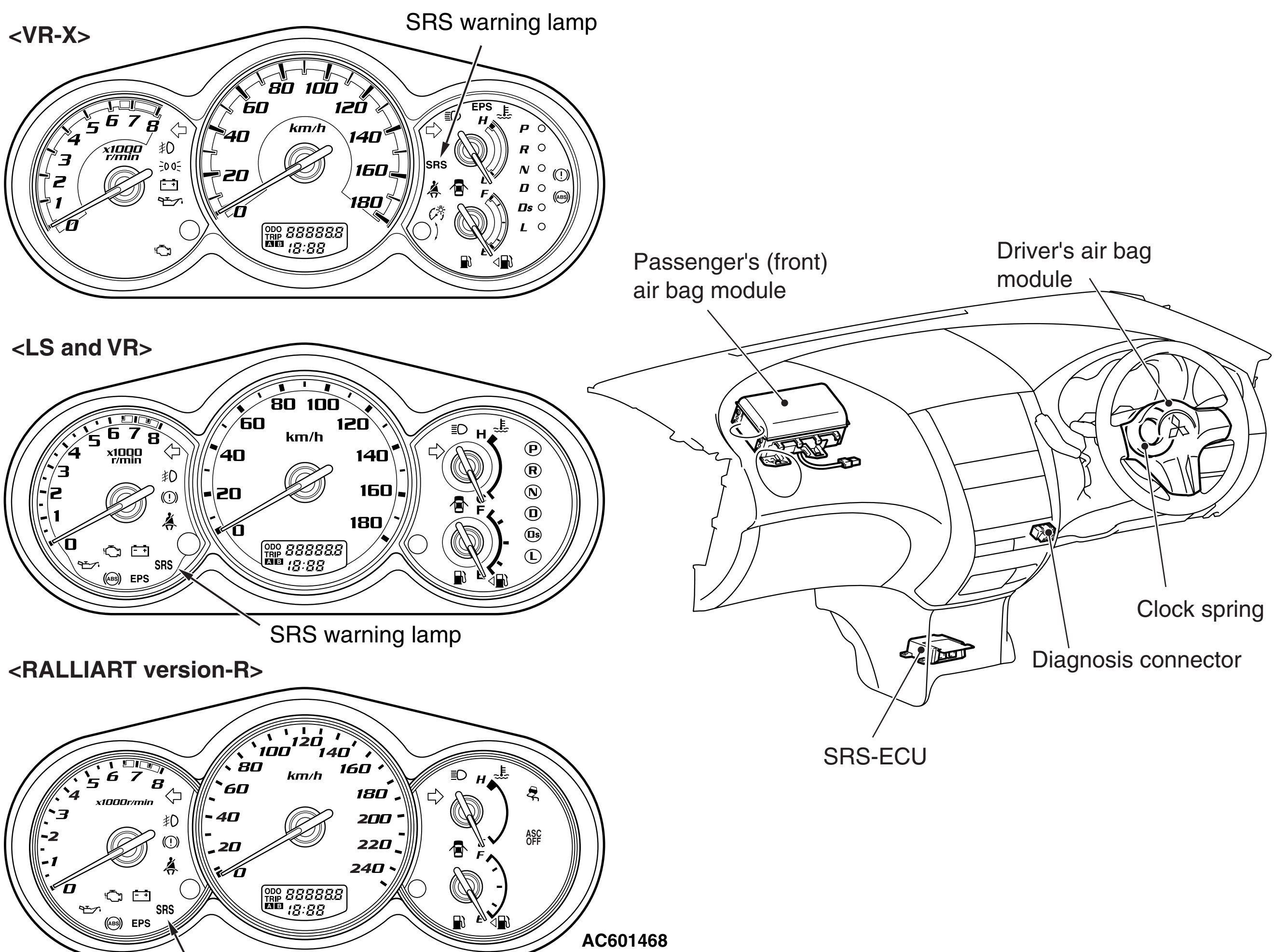
SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

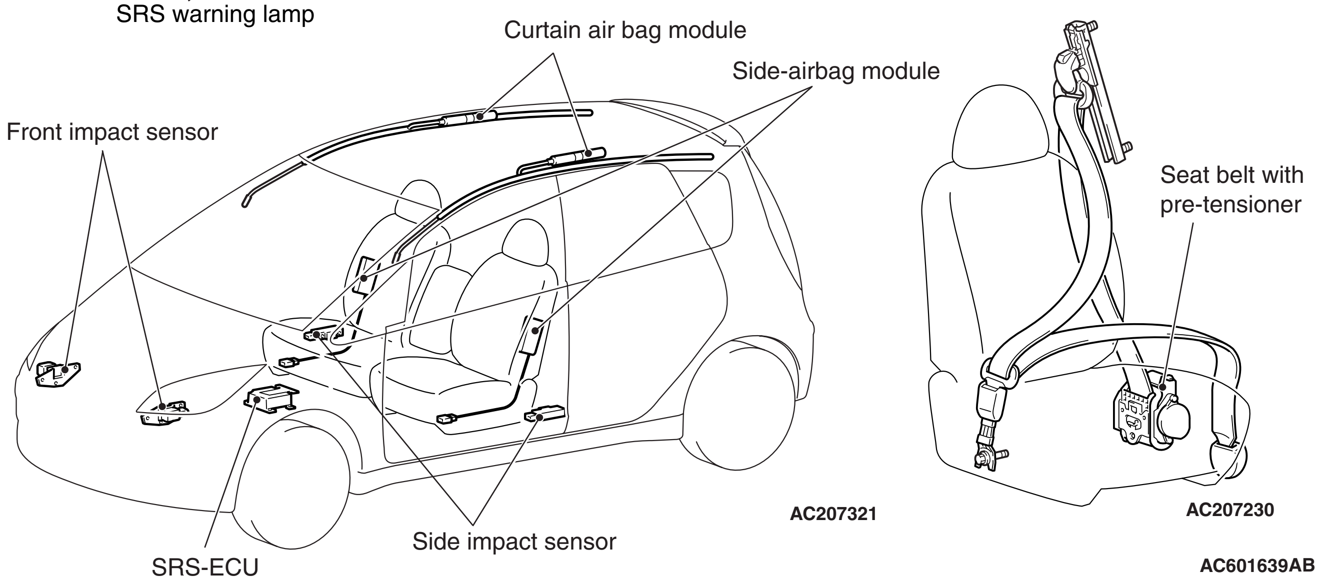
M1001009800365

The Supplemental Restraint System (SRS) and seat belt with pre-tensioner is designed to supplement the driver's and passenger's (front) seat belts to help reduce the risk or severity of injury to the driver and front passenger by activating and deploying both front air bags in certain frontal collisions.

The SRS consist of six air bag modules, SRS air bag control unit (SRS-ECU), front impact sensors, side impact sensors, SRS warning lamp, clock spring and seat belt pre-tensioner. Front air bags are located in the centre of the steering wheel and above the glove box. Each air bag is made up of a folded air bag and an inflator unit. Side-airbags are located inside the front seatback assemblies. The curtain air bag module consists of an air bag, an inflator, and the fixing gear relating to those parts, and is installed in the roof side sections (from the driver's and the passenger's front pillars to the rear pillars). The SRS-ECU is located behind the floor console and has a front air bag safing G-sensor, front air bag analogue G-sensor and a side (curtain) air bag safing G-sensor. The front impact sensor is installed on front end module. The side impact sensor is installed in the lower parts of the centre pillars, and contains an analogue G-sensor. The warning lamp on the instrument panel indicates the operational status of the SRS. The clock spring is installed in the steering column. The seat belt pre-tensioner is built into the driver's and passenger's (front) seat belt retractor.

Only authorized service personnel should do work on or around the SRS components. Those service personnel should read this manual carefully before starting any such work.


<VR-X>
SRS warning lamp
<LS and VR>
SRS warning lamp
<RALLIART version-R>
SRS warning lamp
Passenger's (front) air bag module
Driver's air bag module
Clock spring
Diagnosis connector
SRS-ECU
AC601468


Curtain air bag module
Side-airbag module
Front impact sensor
Seat belt with pre-tensioner
AC207321
AC207230
Side impact sensor
SRS-ECU
AC601639AB

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SRS SERVICE PRECAUTIONS

M1001006000401

⚠ ***DANGER***

In order to avoid injury to yourself or others from accidental deployment of the air bag during servicing, read and carefully follow all the precautions and procedures described in this manual.

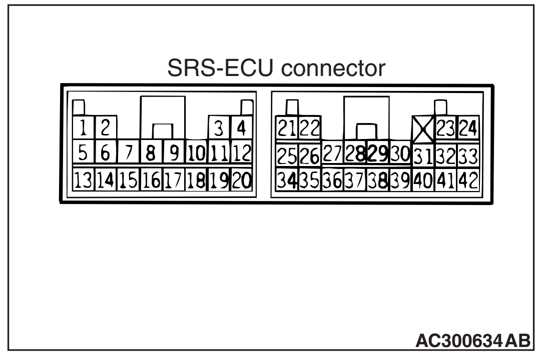
⚠ **CAUTION**

- **Do not use any electrical test equipment on or near SRS components, except those specified on P.52B-9.**
- **Never Attempt to Repair the Following Components:**
  - **SRS-ECU**
  - **Front impact sensor**
  - **Clock spring**
  - **Driver's and passenger's (front) air bag modules**
  - **Seat belt with pre-tensioner**
  - **Side impact sensor**
  - **Curtain air bag module**

NOTE: If any of these components are diagnosed as faulty, they should only be replaced, in accordance with the INDIVIDUAL COMPONENTS SERVICE procedures in this manual, starting at page P.52B-139.

⚠ **CAUTION**

Do not attempt to repair the wiring harness connectors of the SRS. If a defective wiring harness is found, repair or replace it by referring to the table below.



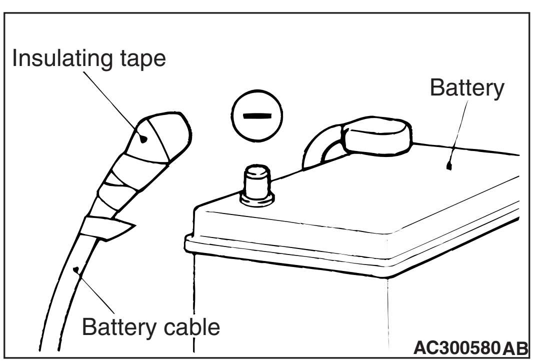
SRS-ECU terminal No.	Destination of harness	Remedy
1, 2	Instrument panel wiring harness → Front wiring harness → Front impact sensor (RH)	Correct or replace each wiring harness.
3, 4	Instrument panel wiring harness → Front wiring harness → Front impact sensor (LH)	Correct or replace each wiring harness.
5, 6	Instrument panel wiring harness → Seat belt pre-tensioner (LH)	Correct or replace the instrument panel wiring harness.
7, 8	Instrument panel wiring harness → Seat belt pre-tensioner (RH)	Correct or replace the instrument panel wiring harness.
9, 10	Instrument panel wiring harness → Air bag module (Front passenger's side)	Correct or replace the instrument panel wiring harness.
11, 12	Instrument panel wiring harness → Clock spring → Air bag module (Driver's side)	Correct or replace instrument panel wiring harness. Replace the clock spring.
13	Instrument panel wiring harness → Junction block (fuse No.37)	Correct or replace the instrument panel wiring harness.
16	Instrument panel wiring harness → Junction block (fuse No.40)	Correct or replace the instrument panel wiring harness.
18	Instrument panel wiring harness → SRS wiring lamp	Correct or replace the Instrument panel wiring harness.

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SRS-ECU terminal No.	Destination of harness	Remedy
19	Instrument panel wiring harness→ Earth	Correct or replace the instrument panel wiring harness.
20	Instrument panel wiring harness → Diagnosis connector	Correct or replace the instrument panel wiring harness.
21, 22	Instrument panel wiring harness → Side-airbag module (LH)	Correct or replace the floor wiring harness.
23, 24	Instrument panel wiring harness → Side-airbag module (RH)	Correct or replace the Instrument panel wiring harness.
27, 28	Instrument panel wiring harness → Curtain air bag wiring harness → Curtain air bag module (LH)	Correct or replace each wiring harness.
29, 30	Instrument panel wiring harness → Curtain air bag wiring harness → Curtain air bag module (RH)	Correct or replace each wiring harness.
34, 36	Instrument panel wiring harness → Side impact sensor (LH)	Correct or replace the Instrument panel wiring harness.
40, 42	Instrument panel wiring harness → Side impact sensor (RH)	Correct or replace the Instrument panel wiring harness.

⚠ DANGER

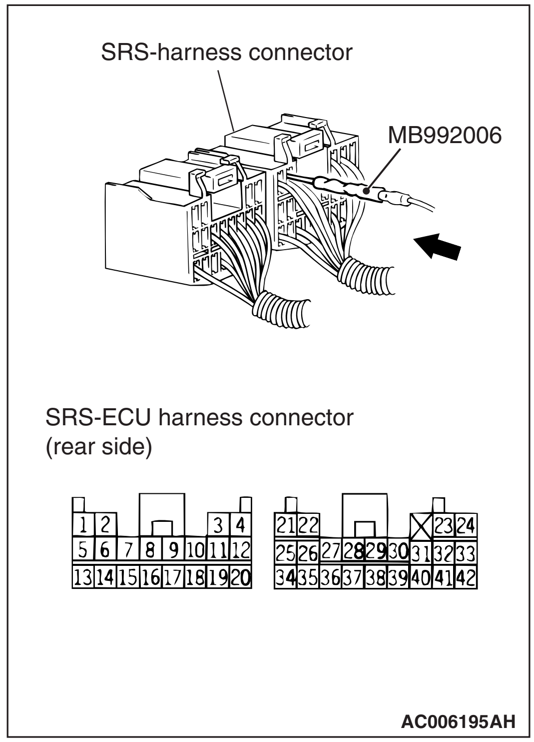
After disconnecting the battery cable, wait 60 seconds or more before proceeding with the following work. In addition, insulate the negative battery terminal with a tape. The condenser inside the SRS-ECU is designed to retain enough voltage to deploy the air bag for a short time even after the battery has been disconnected, so serious injury may result from unintended air bag deployment if work is done on the SRS system immediately after the battery cables are disconnected.



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⚠ CAUTION

- **The SRS components and seat belt with pre-tensioner should not be subjected to heat, so remove the SRS-ECU, driver's and passenger's (front) air bag modules, clock spring, front impact sensor, side impact sensor, side-airbag modules, curtain air bag modules and seat belt pre-tensioner before drying or baking the vehicle after painting.**
  - **SRS-ECU, air bag modules, clock spring, impact sensors: 93°C or more**
  - **Seat belt with pre-tensioner: 90°C or more**
- **Whenever you finish servicing the SRS, always erase the diagnosis code and check warning lamp operation to make sure that the system functions properly.**
- **If checks are carried out by using the SRS-ECU harness connector, observe the following procedures: Insert the special tool extra fine probe (MB992006) into connector from harness side (rear side), and connect the tester to this probe. If any tool than special tool is used, damage to the harness and other components will result. Never insert the probe directly to the terminals from the front of the connector. The terminals are plated to increase their conductivity, so that if they are touched directly by the probe, the plating may break, which will cause drops in reliability.**



SUPPORT LOCATIONS FOR LIFTING AND JACKING

M1001000700190

SUPPORT POSITIONS FOR A GARAGE JACK, AXLE STANDS, SINGLE-POST LIFT OR DOUBLE-POST LIFT AND PLATE TYPE LIFT

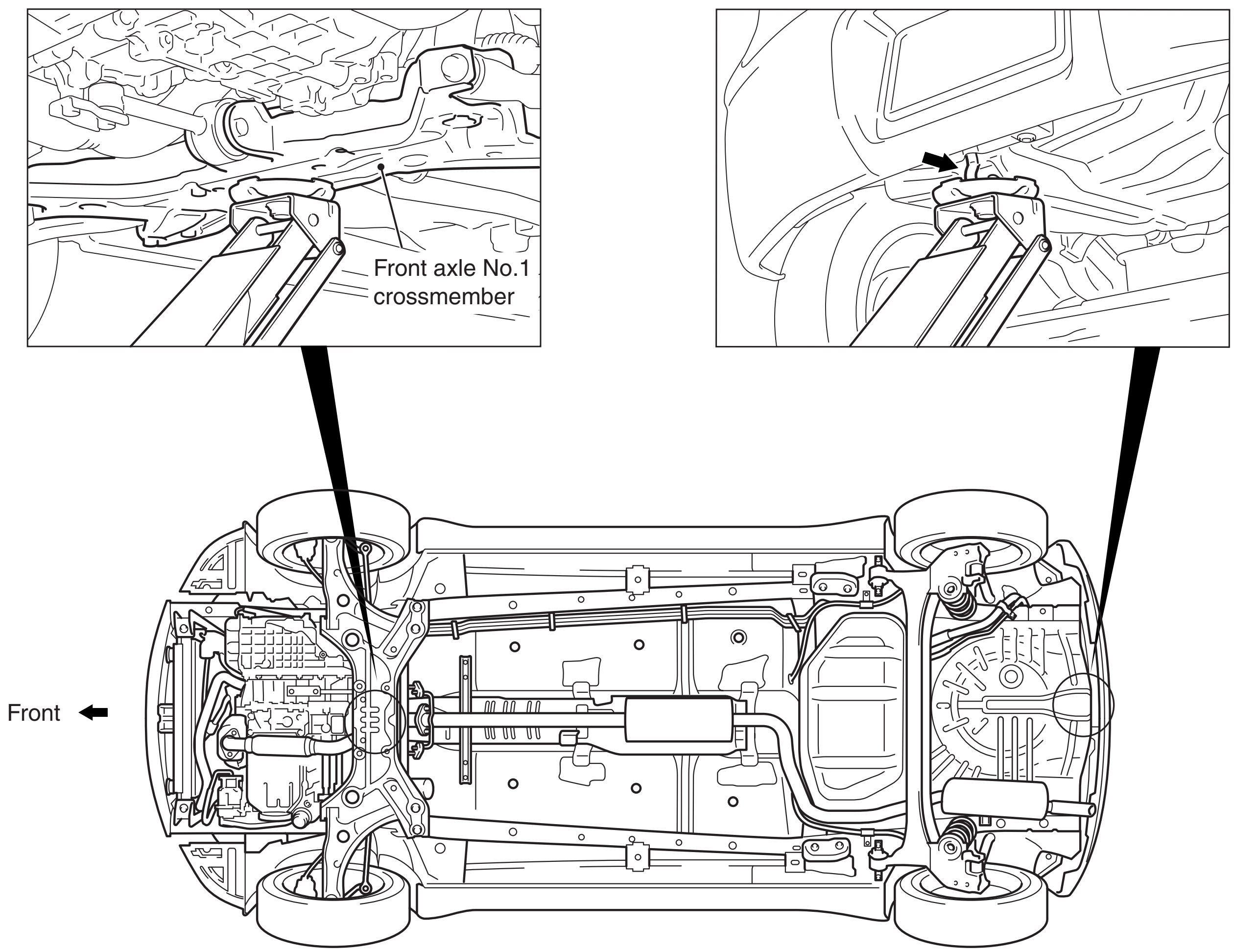
⚠ CAUTION

Do not support the vehicles at locations other than specified supporting points. Doing so will cause damage, etc.

GARAGE JACK

⚠ CAUTION

- **Use a low-profile type garage jack; otherwise use of conventional garage jack may cause interference with bumper etc.**
- **Never support any point other than the specified one, or that point will be deformed.**



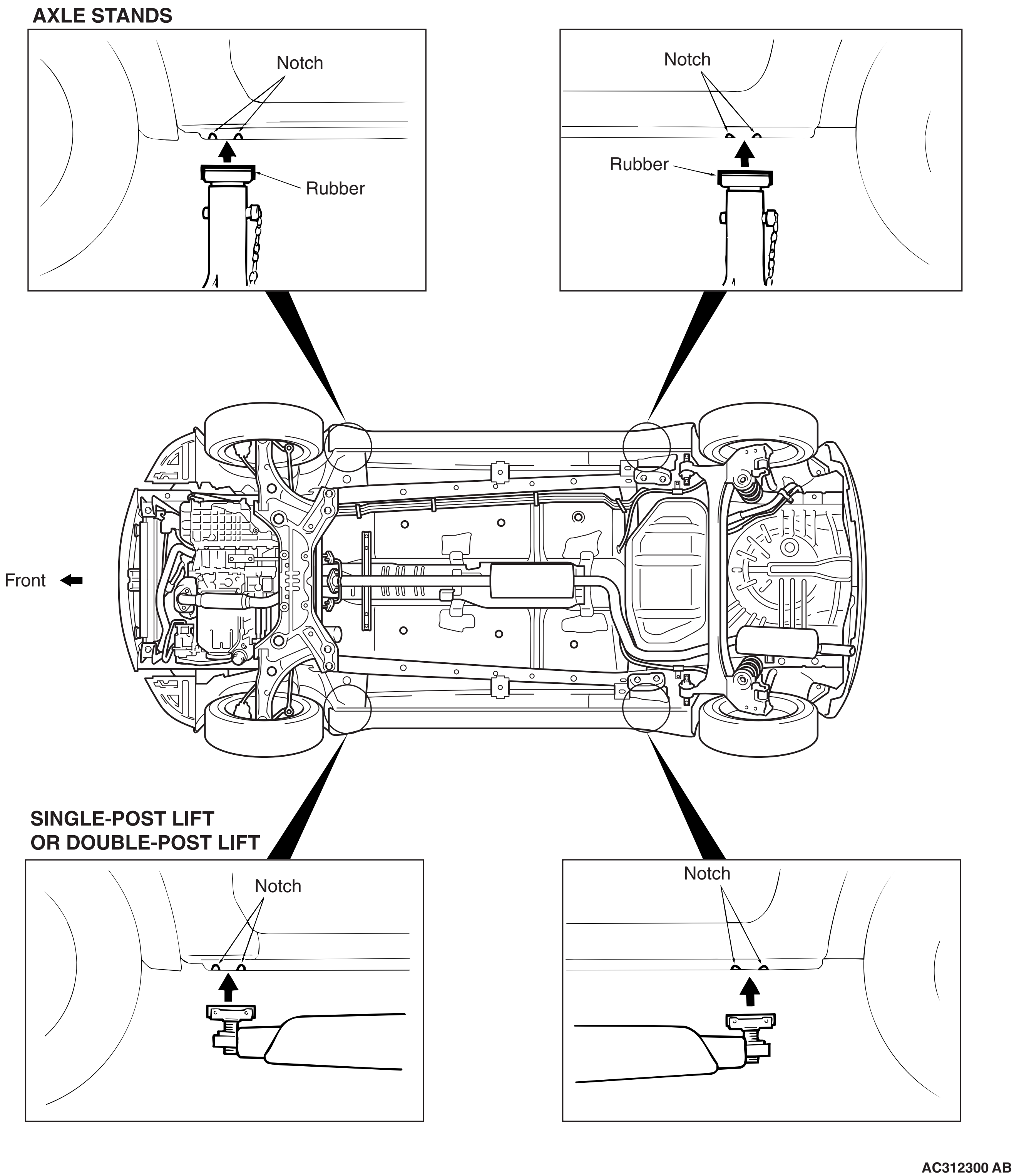
AC312331AB

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AXLE STANDS AND A SINGLE-POST LIFT OR DOUBLE-POST LIFT

⚠ CAUTION

- **If rubber attachments with grooves that are too thick are used at the front support positions, the front fender may become bent, so be sure to use rubber attachments with groove thickness of 18 mm or less.**
- **If attachments which are not high enough are used, they may damage areas such as the side step. Be sure to use attachments which are high enough, or remove the side step if not using attachments.**



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PLATE TYPE LIFT

⚠ CAUTION

To avoid damaging the side sill garnish, put a wooden block between the side sill and a lift.

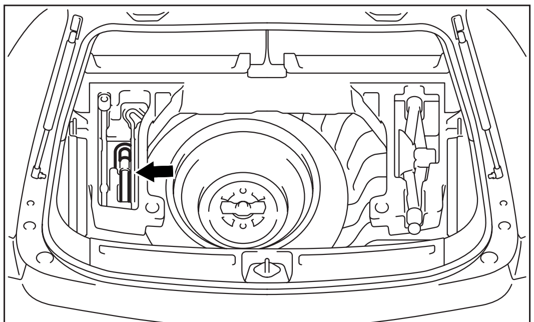
Support the side sill flange with a lift.

TOWING AND HOISTING

M1001000800443

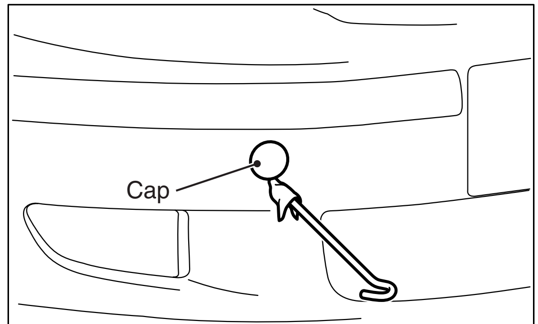
HOW TO ATTACH THE TOWING HOOK

When towing this vehicle, attach the towing hook according to the procedure below.



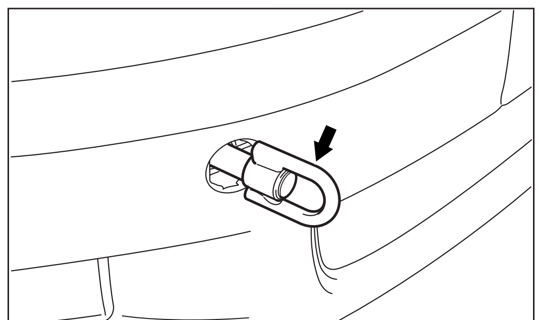
AC207643AB

1. Withdraw the towing hook under the luggage floor board in the luggage compartment.



AC209208AB

2. Remove the cap on the right side of front bumper by using a wheel nut socket wrench or a flat-tipped screwdriver.



AC205837AB

3. Secure the towing hook.

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STANDARD PART/TIGHTENING-TORQUE TABLE

M1001001100500

Each torque value in the table is a standard value for tightening under the following conditions.

1. Bolts, nuts and washers are all made of steel and plated with zinc.
2. The threads and bearing surface of bolts and nuts are all in dry condition.

The values in the table are not applicable:

1. If toothed washers are inserted.
2. If plastic parts are fastened.
3. If bolts are tightened to plastic or die-cast inserted nuts.
4. If self-tapping screws or self-locking nuts are used.

STANDARD BOLT AND NUT TIGHTENING TORQUE

Thread size		Torque N·m		
Bolt nominal diameter mm	**Pitch mm**	**Head mark "4"**	**Head mark "7"**	**Head mark "8"**
M5	0.8	2.5 ± 0.5	5.0± 1.0	6.0 ± 1.0
M6	1.0	5.0 ± 1.0	8.5 ± 1.5	10 ± 2
M8	1.25	11 ± 2	20 ± 4	24 ± 4
M10	1.25	23 ± 4	42 ± 8	53 ± 7
M12	1.25	42 ± 8	80 ± 10	93 ± 12
M14	1.5	70 ± 10	130 ± 20	150 ± 20
M16	1.5	105 ± 15	195 ± 25	230 ± 30
M18	1.5	150 ± 20	290 ± 40	335 ± 45
M20	1.5	210 ± 30	400 ± 60	465 ± 65
M22	1.5	290 ± 40	540 ± 80	630 ± 90
M24	1.5	375 ± 55	705 ± 105	820 ± 120

FLANGE BOLT AND NUT TIGHTENING TORQUE

Thread size		Torque N·m		
Bolt nominal diameter mm	**Pitch mm**	**Head mark "4"**	**Head mark "7"**	**Head mark "8"**
M6	1.0	5.0 ± 1.0	10 ± 2	12 ± 2
M8	1.25	13 ± 2	24 ± 4	28 ± 5
M10	1.25	26 ± 5	50 ± 5	58 ± 7
M10	1.5	25 ± 4	46 ± 8	55 ± 5
M12	1.25	47 ± 9	93 ± 12	105 ± 15
M12	1.75	43 ± 8	83 ± 12	98 ± 12

NOTE:

- *Be sure to use only the specified bolts and nuts, and always tighten them to the specified torques.*
- *Bolts marked with indications such as 4T or 7T are reinforced bolts. The larger the number, the greater the bolt strength.*